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LaRC DAAC M&O Equipment (As Built Configuration)

Technical Paper

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Abstract

This document supplies a basic overview of the maintenance and operations office environment provided at the LaRC DAAC.

Keywords: LaRC, M&O, Hardware, COTS, Software.

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Abstract

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Abbreviations and Acronyms

1. Introduction

1.1 Purpose

The purpose of this document is to present an overview description of the maintenance and operations HW used by the LaRC DAAC staff to monitor, analyze, report, and manage the operational HW and SW. This document has been written to describe the essential hardware components and is intended to document the HW and SW configurations.

Appendix A contains a description of DAAC supplied, non-ECS procured, HW that has been added to the ECS M&O network. This HW is not covered by this specification but is provided for reference purposes.

1.2 Organization

The remainder of the document is organized as follows:

- Section 2: Related Documents
- Section 3: LaRC DAAC M&O Equipment Requirements
- Section 4: LaRC DAAC M&O Equipment
- Section 5: LaRC DAAC M&O Equipment Test Results
- Appendix A: Non-ECS Hardware
- Abbreviations and Acronyms

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2. Related Documentation

2.1 Parent Documents

The parent documents are the documents from which this document's scope and content are derived.

423-41-01	Goddard Space Flight Center, EOSDIS Core System (ECS) Statement of Work

2.2 Applicable Documents

Documents referenced in this document are listed below.

920-series General Documents

920-TDL-005	LaRC Cable Management Plan

921-series General Documents

921-TDL-001	LaRC Hardware Network Diagram
921-TDL-002	LaRC Hardware Network Diagram
921-TDL-003	LaRC Hardware Network Diagram

ECS CDRLs

601-CD-001	Maintenance and Operations Management Plan for the ECS Project
607-CD-001	Maintenance and Operations Position Descriptions for the ECS Project
608-CD-001	ECS Operations Plan for Release B

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3. LaRC DAAC M&O Equipment Requirements

Section 4 describes the functions performed using the LaRC DAAC M&O equipment. The following comprise the requirements for this equipment.

3.1 General

LaRCMO0100 Number of staff. The LaRC DAAC M&O Equipment shall provide, at a minimum, the tools for the following numbers of DAAC staff:

a. Management and Administration[1]: 1

b. Engineering[2]: 19

c. Operations[3]: 22

LaRCMO0110 System administration. The capability to backup and restore files from each component shall be provided.

LaRCMO0120 Status and performance reports. The LaRC DAAC M&O Equipment shall provide the tools to review and analyze system status and performance reports.

LaRCMO0130 Management and technical reports. The LaRC DAAC M&O Equipment shall provide the tools to review and/or develop management and technical reports on ECS performance.

LaRCMO0140 DAAC internal coordination. The LaRC DAAC M&O Equipment shall provide the tools in support of coordination within the DAAC.

LaRCMO0150 DAAC external coordination. The LaRC DAAC M&O Equipment shall provide the tools in support of coordination with other organizations including, at a minimum, other DAACs, the SMC, and other ECS organizations.

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[1] Positions per DIDs 607 & 608: DAAC ECS Contract Manager, DAAC Administrative Assistant

[2] Positions per DIDs 607 & 608: DAAC System Engineer, DAAC SW Maintenance Engineer, DAAC System Test Engineer, DAAC System Administrator, DAAC Database Administrator, DAAC Resource Planner, DAAC CM Administrator, DAAC ILS Administrator, DAAC Science SW I&T Support Engineer, DAAC Science Coordinator

[3] Positions per DIDs 607 & 608: DAAC Maintenance Coordinator, DAAC User Services Representative, DAAC Science Data Specialist, DAAC Operations Supervisor, DAAC Production Planner, DAAC Production Monitor, DAAC Resource Manager, DAAC Archive Manager, DAAC Ingest/Distribution Technician, DAAC Computer Operator, DAAC Operations Readiness & Performance Assurance

LaRCMO0160 ECS documentation. The LARC DAAC M&O Equipment shall provide the tools to access, create, and maintain ECS documentation.

3.2 Management and Administration

LaRCMO0200 Management planning resources. The LaRC DAAC M&O Equipment shall provide tools to support planning, budgeting, accounting, resource management, scheduling and other contract management activities.

LaRCMO0210 Management policies and procedures. The LaRC DAAC M&O Equipment shall provide the tools to develop and maintain ECS, DAAC and/or building policies and procedures.

LaRCMO0220 Management documents. The LaRC DAAC M&O Equipment shall provide tools for production and maintenance of memos, reports, and expense reports.

3.3 Engineering

LaRCMO0300 Operations data. The LaRC DAAC M&O Equipment shall provide the tools to allow for retrieval, storage, analysis, and distribution of operations data.

LaRCMO0310 DAAC analysis software. The LaRC DAAC M&O Equipment shall provide the tools to create and maintain DAAC-unique software.

3.4 Operations

LaRCMO0400 Operations policies and procedures. The LaRC DAAC M&O Equipment shall provide the tools to develop and administer policies, directives, and guidance to implement both ECS and DAAC operations tasking, procedures, practices, and priorities.

4. LaRC DAAC M&O Equipment

The HW and SW provided for M&O personnel to use for data collection, reduction, analysis, reporting and internal and external coordination and communications (as distinct from performance of the ECS mission using the operational resources, e.g., Data Server Subsystem, Communications Subsystem, Systems Management Subsystem, etc.). These HW and SW resources allow the engineering personnel to perform the duties described in DID 601, ***Maintenance and Operations Management Plan***, and DID 607***, ECS Maintenance and Operations Position Descriptions***. The approximate number of personnel at the DAAC is shown in DID 608, ***ECS Operations Plan for Release B***.

Table 4-1 partitions these resources into three functional areas.

Table 4-1. LaRC M&O Equipment Component Descriptions

Functional Area	Class/Type	Specifics
Management and Administration	PC	Personal computers
Engineering	X-Term	NCD HMX X-Terminals
	Printer	HP printers*
	PC	Personal computers
	Workstations	Sun workstations
	Servers	Sun servers*
	Storage	Sun disk arrays*
	Tape Drives	DLT's*
Operations	PC	Personal computers

4.1 LaRC DAAC Functions

4.1.1 Management and Administration

The Management and Administration (MA) elements allow the management and supervisory staff at the DAAC to effectively communicate with other members of the DAAC staff as well as with external parties. Primary tasks performed on these resources include:

- ECS performance analysis - review and analyze system status and performance reports;
- ECS performance reporting - review and/or development of management and technical reports on ECS performance;

* Also supports Management and Administration, and Operations

- DAAC Manager liaison - provide a point of contact to the DAAC Manager and staff on all ECS On-Site M&O organization activities;
- ECS M&O Office liaison - provide management liaison to ECS M&O Office staff including ECS staff at other DAACs, the SMC, the EOC, the SEO, the parent ECS M&O organization, and development and support organizations;
- ECS personnel supervision - manage ECS training, certification;
- ECS planning, budgeting, accounting, resource management, scheduling and subcontract management - provide financial management and reporting on the ECS On-Site M&O organization;
- ECS policies and priorities - ensure that ECS On-Site personnel are tasked in accordance with ECS policies and priorities as driven by DAAC needs; ensure that company, ECS, DAAC and/or building, procedures and policies;
- Administrative support - support planning, budgeting, accounting, resource management, scheduling and contract management activities;
- Secretarial support - provide typing, filing, expense reports, mail distribution, meeting scheduling, etc.

4.1.2 Engineering

The engineering staff at the DAAC provides the primary set of skills to monitor current performance, monitor and develop short and long term trending data, analyses and reports, and develop configuration changes/tunings. These tasks are required so that the operational resources provide reliable, high performance support to the DAAC's customers.

The primary tasks are performed in whole or in part by this staff are:

- ECS algorithm development support - provide support to scientists in the development of algorithms that are executed by the ECS system;
- ECS algorithm I&T support - provide support to scientists in the test and integration of updated and new algorithms that are executed by the ECS system;
- ECS configuration management - coordinate usage of approved configuration management (CM) procedures; ensure that changes to the hardware, software, and procedures are properly documented and coordinated; if requested by Customer, provide recording secretarial tasks for the Customer Configuration Change Board (CCB); generate CCB monthly reports; prepare agendas for CCB meetings;
- ECS database administration - maintain the data bases and structure of the integrated system at the DAAC; provide the operations interface to perform data base administration utilities such as data base backup and recovery, performance monitoring, and tuning; administer user access control and daily data base synchronization;

- ECS development organization liaison - provide feedback on the performance of installed systems; coordinate future installations; support development activities such as design and document reviews; coordinate trouble tickets (TTs) and Configuration Change Requests (CCRs);
- ECS hardware maintenance - support the ECS availability requirements by replacement of LRUs; act as coordination point with the various vendors at the DAAC including preventative maintenance support; support the isolation of equipment problems; report on maintenance activities to the ECS ILS function;
- ECS integrated logistics support - interface with ECS ILS function in coordination of delivery of COTS hardware or software; handle ECS center shipping and receiving; act as local ILS representative;
- ECS performance analysis - analyze soft and hard copy reports on system effectiveness, productivity, capacity, and performance for ECS hardware and software resources and processes; monitor performance for trends and prepare reports on analyses;
- ECS planned upgrades - support and participate in planning and implementation of upgrades to the ECS;
- ECS property management - provide control of Government property; provide continuous audit trail from receipt of ECS procured or developed items until transfer of accountability;
- ECS quality assurance - perform Quality Assurance (QA) audits on a periodic basis to ensure adherence to established standards and procedures for hardware, software and operations; produce audit;
- ECS resource control - maintain and modify hardware and software system configurations, perform COTS administration (including operating system administration); support property management; support system anomaly tracking and analysis;
- ECS software maintenance - produce, deliver, and document corrections, modifications, and enhancements made to ECS software (including COTS), and/or adapt or incorporate COTS software for ECS use;
- ECS sustaining engineering - analyze and identify ways to accommodate needed improvements, new technologies and new concepts; manage system upgrades and evolution; control and maintain ECS updates; perform the activities necessary to assure ECS reliability, maintainability, and availability; support/provide evaluation of user inputs and monitor system performance to tune the system for optimum response and support; support operational readiness and performance assurance;
- ECS test and integration - feature test (i.e., ensure a new requirement and/or design is properly implemented) and regression test (i.e., ensure that previously provided capabilities continue to be properly provided) all system upgrades in DAAC

environment; maintain and update test procedures and data bases; provide test statistics, analyses and reports.

4.1.3 Operations

The operations staff at the DAAC primarily performs its tasks using the deployed operational components. There following tasks, however, are performed in whole or in part using M&O resources.

- ECS operations personnel supervision - provide first line supervision of ECS operations, conflict resolution, policy enforcement, time keeping, productivity monitoring, shift worker scheduling, hiring, termination, promotions, performance appraisals, salary adjustments, discipline, etc., and
- ECS operations policy - develop and administer policies, directives, and guidance to implement both ECS and DAAC operations tasking, procedures, practices, and priorities.
- ECS operations readiness - ensure elements are in a state of operational readiness at all times including launch preparations; conduct Operational Readiness Reviews and monitor M&O activities, provide visibility to DAAC, ESDIS and ECS management on operations readiness;
- ECS operations training and certification - develop and maintain center specific initial and refresher operations training and certification packages; maintain training and certification records; report on staff training; coordinate with SEO system-level training and certification requirements;
- ECS performance assurance - provide coverage of operational phase activities in PAIP (DID 501); continue the tasks of the RMA program throughout the operational phase;
- ECS production scheduling - schedule system updates and maintenance schedules; coordinate user requests.
- ECS operations coordination - exchange operations information between and among DAAC operators and with personnel at other locations.

4.2 Design Components

The components that comprise the LARC M&O equipment are shown in Figures 4.2-1 as well as additional DAAC supplied equipment listed in Appendix A.

Tables 4.2-1 and 4.2-2 show the HW/SW mappings for the PCs and Sun equipment. Figure 4.2-2 shows the M&O LAN network topology.

Network cabling is shown in ***LARC Cable Management Plan***, 920-TDE-005.

The location of the M&O equipment in the facility is under the control of the DAAC and is documented in the property management database administered by the DAAC.

Disk configurations for the M&O equipment are under the control of the DAAC administrator.

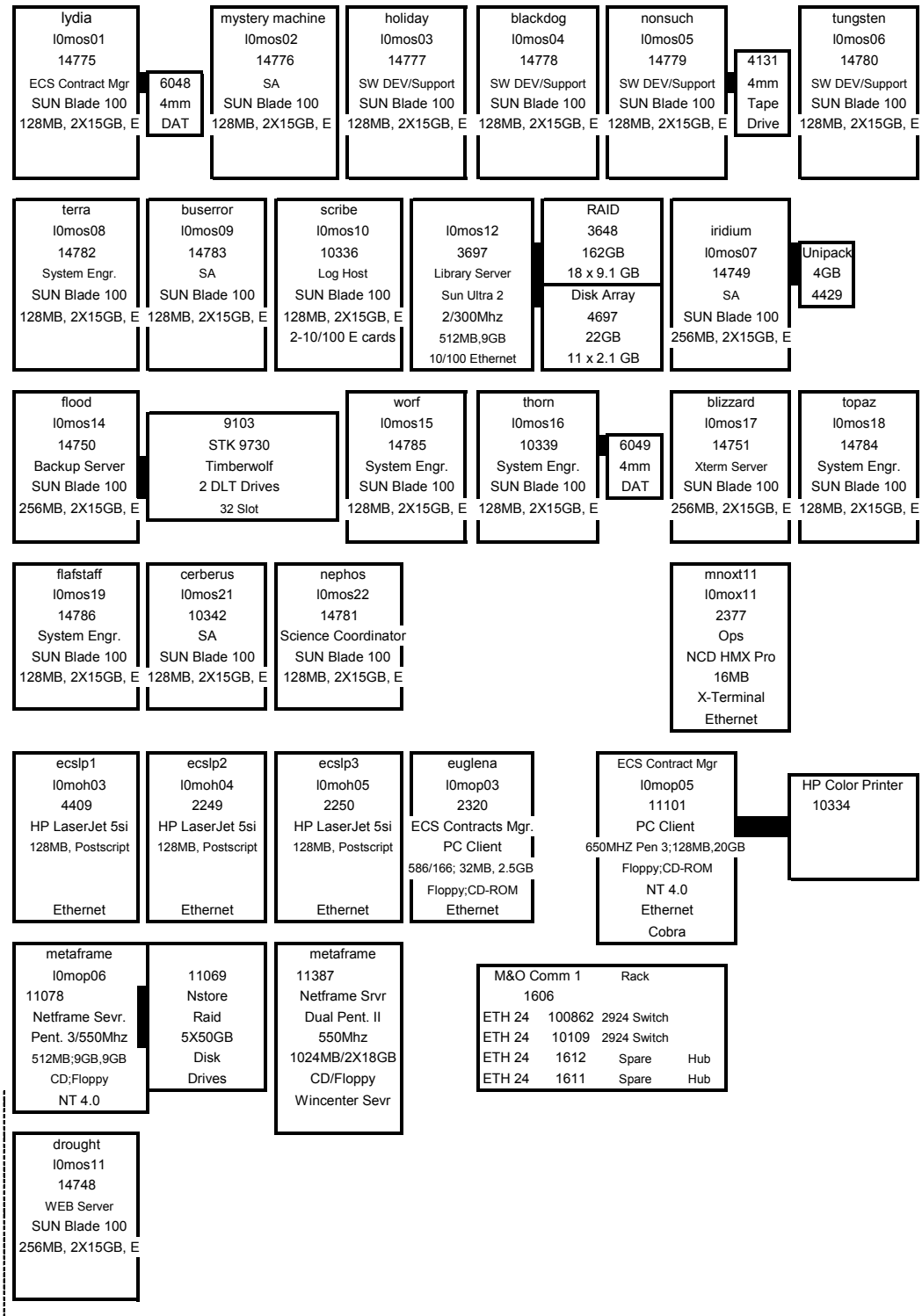


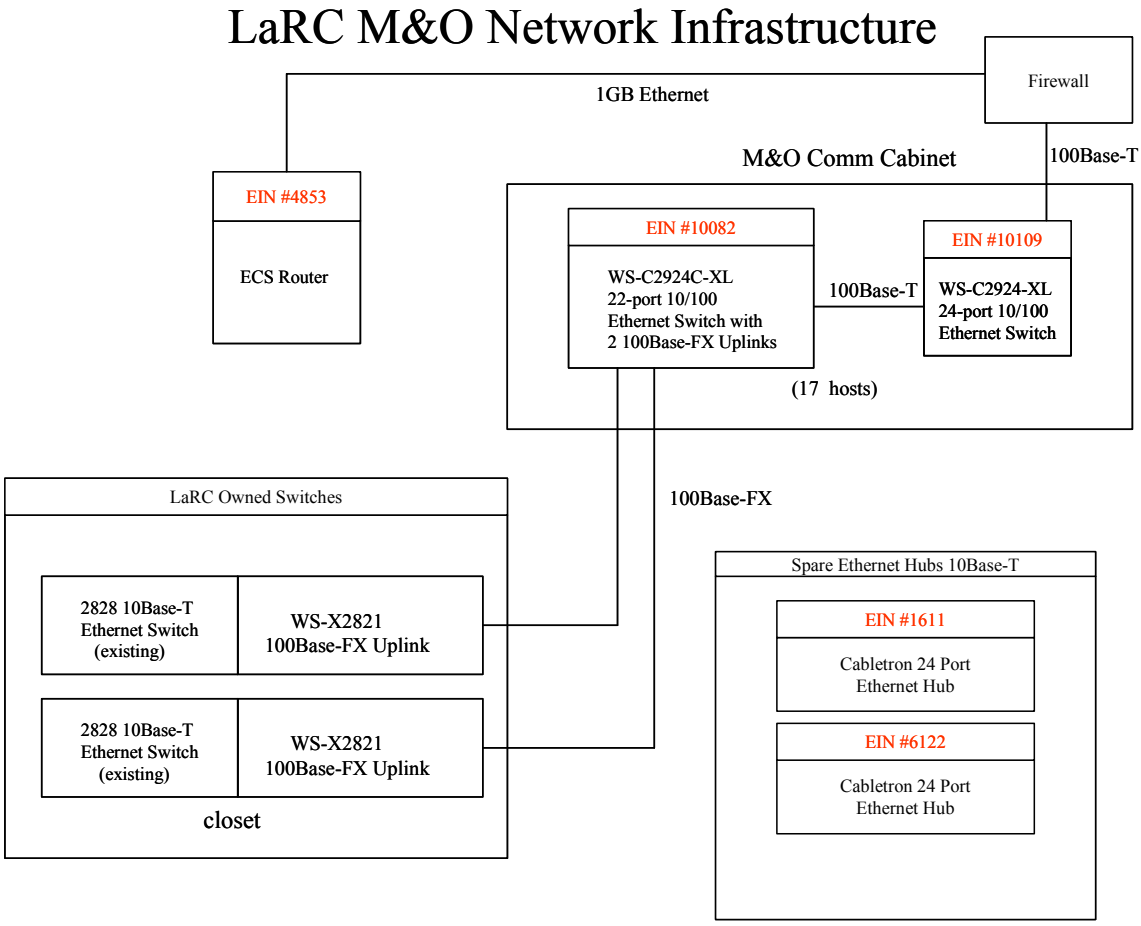
Figure 4.2-1. LARC ECS M&O Engineering and Operations HW (As Built Configuration)

Table 4.2-1. LaRC ECS M&O HW/SW Mapping

Win 2000	Host Name	Windows NT 4.0	Microsoft Office 2000	Humngbrd Exceed 6.0	Office 97	LINUX 7.0	Windows 95	MS Project 98	Ssh2 Client	BSD UNIX	Microsoft Project 2000
	SAIC-PC001	X	X	X					X		
	SAIC-PC002	X	X	X					X		
	SAIC-PC003	X	X	X					X		
	SAIC-PC004	X	X	X					X		
	SAIC-PC005	X	X	X					X		
	SAIC-PC006	X	X	X					X		
	SAIC-PC007	X	X	X					X		
	SAIC-PC008	X	X	X					X		
	SAIC-PC009	X	X	X					X		
	SAIC-PC010	X	X	X					X		
	SAIC-PC011	X	X	X					X		
	l0mop03 euglena			X	X		X	X	X		
	l0mop05 cobra	X	X	X					X		X
	l0mop06 bfdstore			X		X			X		
X	metaframe		X	X					X		
	excalibur	X	X	X					X		
	dragon1	X	X	X					X		
	foxfire		X	X		X			X		
	jonestown	X	X	X					X	X	
	quickening	X	X	X					X		
	misr	X	X	X					X		
	xenon		X	X		X			X		
	datapimp		X	X		X			X		
	goddess	X	X	X					X		
	salem	X	X	X					X		
	pyramid	X	X	X					X		
	ajtpc	X	X	X					X		
	tenbears		X	X		X					
X	BOB		X	X					X		
	beaker	X	X	X	X				X		
	greenghost		X			X			X		
	extropia		X			X			X		
	supernova					X			X		

Table 4.2-2. LARC UNIX Workstations HW/SW Map

Host Name	Solaris 2.8	F-Secure SSH Server/ Client	Legato Networker 6.1
lydia	2.8	X	X
mystery machine	2.8	X	
holiday	2.8	X	X
blackdog	2.8	X	X
nonsuch	2.8	X	X
tungsten	2.8	X	X
iridium	2.8	X	
terra	2.8	X	X
buserror	2.8	X	
scribe	2.8	X	X
tsunami	2.8	X	X
blizzard	2.8	X	X
drought	2.8	X	X
flood	2.8	X	X
thorn	2.8	X	X
worf	2.8	X	X
cerberus	2.8	X	
nephos	2.8	X	X
topaz	2.8	X	X
flagstaff	2.8	X	X



Notes: Cable between WS-C2924 Ethernet Switches is a Cat 5 cross-over cable.
Cable between WS-C2924C Ethernet Switch and the ECS Router is a Cat-5 straight-through cable.
Cables between WS-2924C Ethernet Switch Uplinks and the WS-X2821 uplinks are multi-mode fiber with SC connectors.

Figure 4.2-2. LARC M&O LAN Topology

5. LARC DAAC M&O Equipment Test Results

5.1 LARC DAAC Requirements Traceability

Table 5-1 shows the mapping of Section 3 requirements to LARC M&O hardware and software elements described in section 4.

Table 5-1. LARC DAAC M&O Requirements Mapping (1 of 3)

Requirement	Description	SW Component(s)
LARCMO0100	Number of staff	PCs: Microsoft Office 2000 Norton Utilities 2002 Hummingbird Exceed 6.1 Windows NT 4.0 Workstations/Servers: Sun Solaris 2.8
LARCMO0110	System administration	PCs: Microsoft Office 2000 Norton Utilities 2002 Hummingbird Exceed 6.1 Windows NT 4.0 Workstations/Servers: Sun Solaris 2.8 Legato Networker 6.1
LARCMO0120	Management status and performance reports	PCs: Hummingbird Exceed 6.1 Windows NT 4.0 Microsoft Office 2000 Microsoft Project 2000 Norton Utilities 2002
LARCMO0130	Management and technical reports	PCs: Hummingbird Exceed 6.1 Windows NT 4.0 Norton Utilities 2002 Microsoft Office 2000

Table 5-1. LARC DAAC M&O Requirements Mapping (2 of 3)

Requirement	Description	SW Component(s)
LARCMO0140	DAAC internal coordination	PCs: Hummingbird Exceed 6.1 Windows NT 4.0 Microsoft Office 2000 Microsoft Project 2000 Norton Utilities 2002 Workstations/Servers: Sun Solaris 2.8 z-Mail
LARCMO0150	DAAC external coordination	PCs: Hummingbird Exceed 6.1 Windows NT 4.0 Microsoft Office 2000 Microsoft Project 2000 Norton Utilities 2002 Workstations/Servers: Sun Solaris 2.8 z-Mail
LARCMO0160	ECS documentation	PCs: Hummingbird Exceed 6.1 Windows NT 4.0 Microsoft Office 2000 Norton Utilities 2002
LARCMO0200	Management planning resources	PCs: Hummingbird Exceed 6.1 Windows NT 4.0 Microsoft Office 2000 Microsoft Project 2000 Norton Utilities 2002
LARCMO0210	Management policies and procedures	PCs: Hummingbird Exceed 6.1 Windows NT 4.0 Microsoft Office 2000 Norton Utilities 2002
LARCMO0300	Operations data	PCs: Hummingbird Exceed 6.1 Windows NT 4.0 Microsoft Office 2000 Norton Utilities 2002

Table 5-1. LARC DAAC M&O Requirements Mapping (3 of 3)

Requirement	Description	SW Component(s)
LARCMO0310	DAAC unique software	Workstations/Servers: Sun Solaris 2.8 z-Mail Sparcworks Visual Workshop C++ Tools H++ DB Tools H++ Core Library Sybase CT Library Access SW Parts Manager
LARCMO0400	Operations policies and procedures	PCs: Hummingbird Exceed 6.1 Windows NT 4.0 Microsoft Office 2000 Norton Utilities 2002

5.2 Test Results

Installation of the LARC DAAC M&O Hardware occurred in 1997 and 1998. When the hardware and software was installed, each computer was initialized and the functionality of all HW, SW, and networks verified.

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Appendix A. Non-ECS Hardware

DAAC provided hardware has been added to the ECS M&O suite. These resources are not formally part of this document but are provided for reference purposes. Figure A-1 shows the additional hardware.

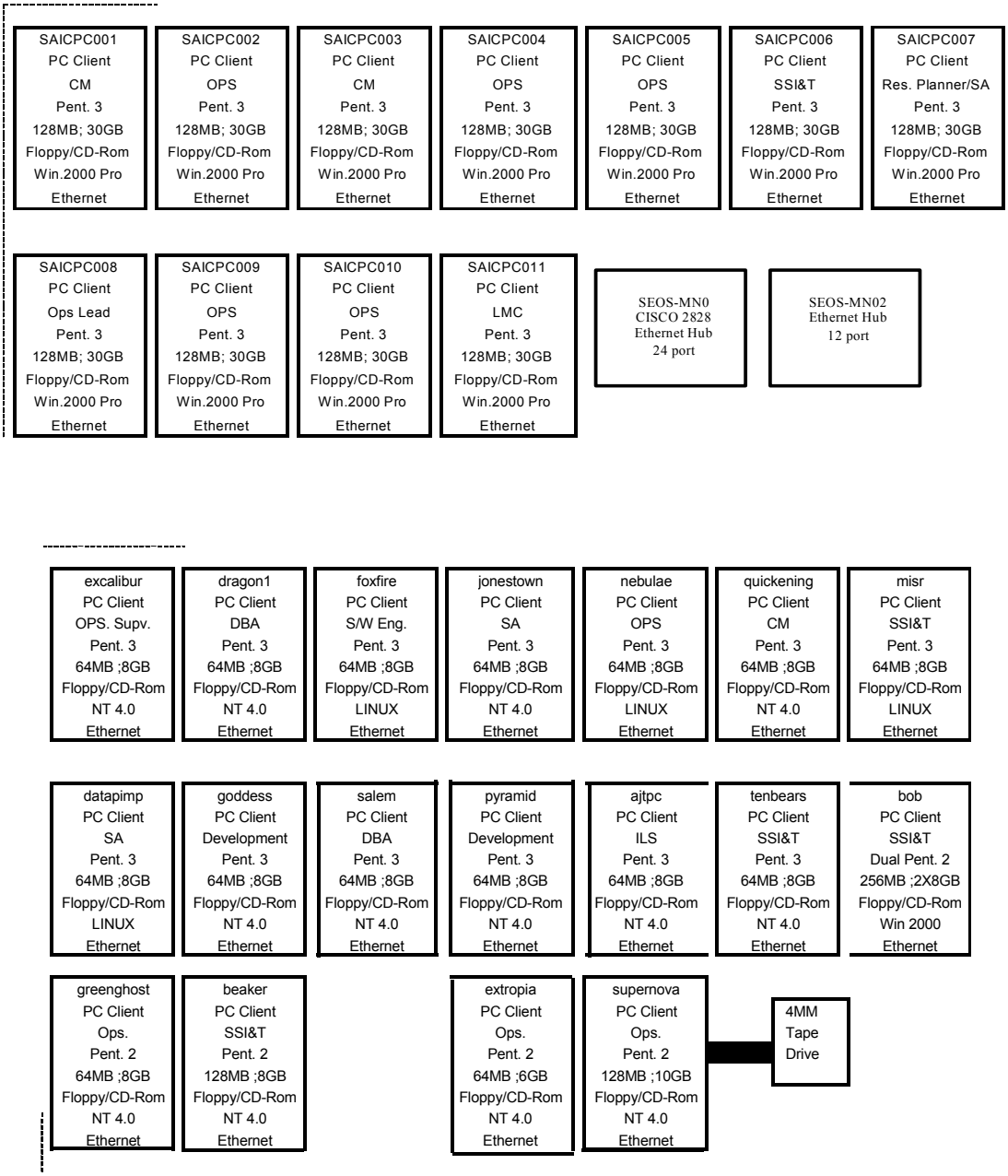

Figure A-1. LARC DAAC Supplied Operations Hardware

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Abbreviations and Acronyms

CCB	Configuration Control Board
CCR	Configuration Change Request
CM	Configuration management
COTS	Commercial Off the Shelf
DAAC	Distributed Active Archive Center
ECS	EOSDIS Core System
LARC	Langley Research Center, Hampton, VA
HW	Hardware
ILS	Integrated Logistics Support
LRU	Line Replaceable Unit
M&O	Maintenance and Operations
QA	Quality assurance
RMA	Reliability, Maintainability, Availability
SMC	System Monitoring Center
SW	Software
TT	Trouble tickets

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